CLAIMS

1. A wind power plant comprising at least one high voltage rotary generator coupled to a turbine (102) via shaft means (101) and having a stator (3) with at least one winding and a rotor, characterised in that the at least one stator winding is provided with a solid insulation system and is arranged to be directly connected via coupling elements (109) to a transmission or distribution network (110) having a voltage of between 2 and 50 kV, preferably higher than 10 kV.

2. A plant as claimed in claim 1, characterised in that the or each stator winding comprises a cable (6) intended for high voltage comprising one or more current-carrying conductors (31) surrounded by said solid insulation system.

3. A plant as claimed in claim 2, characterised in that the solid insulation system comprises at least two spaced apart semiconducting layers each providing essentially an equipotential surface, and an intermediate insulating layer between the semiconducting layers having substantially the same coefficient of thermal expansion as at least one of the semiconducting layers.

4. A plant as claimed in claim 3, characterised in that the innermost semiconducting layer (32) is at substantially the same potential as the said conductor(s) (31).

5. A plant as claimed in either claim 3 or claim 4, characterised in that the outer semiconducting layer (34) is arranged to form essentially an equipotential surface surrounding the conductor(s) (31).

6. A plant as claimed in claim 5, characterised in that said outer semiconducting layer (34) is connected to a predefined potential.

7. A plant as claimed in claim 6, characterised in that the predefined potential is earth potential.

8. A plant as claimed in any one of claims 3 to 7, characterised in that the current-carrying conductors comprise a plurality of electrically insulated strands and at least one uninsulated strand.

9. A plant as claimed in any one of the preceding claims, characterised in that the rotor (2) is equipped with a short-circuited winding, resulting in a generator of the induction type.

10. A plant as claimed in any one of claims 1 to 8, characterised in that the rotor (2) is equipped with a field winding in which DC-current flows, resulting in a generator of the synchronous type.

11. A plant as claimed in any one of claims 2 to 10, characterised in that the cables (6) with solid insulation have a conductor area of between 10 and 200 mm^2 and have an outer cable diameter of between 10 and 40 mm.

12. A plant as claimed in any one of the preceding claims, characterised in that the said generator (100) is designed for high voltage and is arranged to supply the outgoing electric network (110) directly without any intermediate connection of a transformer.

13. A plant as claimed in claim 12, characterised in that said generator (100) is earthed via an impedance (103).

14. A plant as claimed in claim 12, characterised in that said generator (100) is directly earthed.

15. A plant as claimed claim 12, characterised in that the generator is arranged to generate power to various voltage levels.

16. A plant as claimed claim 15, characterised in that one of said voltage levels is arranged to generate auxiliary power and that the auxiliary power is arranged to be generated from a separate winding (119;113) in the generator (100).

17. A plant as claimed in any one of the preceding claims, characterised in that it comprises several generators, each of which lacks an individual step-up transformer, but which, via a system transformer common to the generators, is connected to the transmission or distribution network.

18. A plant as claimed in any one of the preceding claims, characterised in that the winding of the or each generator is arranged for self-regulating field control and lacks auxiliary means for control of the field.

19. A plant as claimed in any one of the preceding claims, characterised in that the windings of the or each generator can be connected for multiple-speed operation using different numbers of poles, e.g. Dahlander-coupling.

20. A plant as claimed in any one of the preceding claims, characterised in that at least one wind turbine is equipped with two or more generators having different numbers of poles so that multiple-speed operation is possible.

21. A plant as claimed in any one of the preceding claims, characterised in that the or each generator is connected to a frequency convertor comprising a rectifier, a DC-link and an inverter.

22. A plant as claimed in claim 21, characterised in that series connected valves are used in the inverter and the rectifier.

23. A plant as claimed in claim 22, characterised in that the inverter is net commutated with current-stiff DC-link.

24. A plant as claimed in claim 22, characterised in that the inverter is self commutated and consists of series-connected IGBTs.

25. An electric generator (100) for high voltage included in a wind power plant in which the generator is coupled to a turbine (102) via shaft means (101), said generator (100) comprising a stator with at least one stator winding and a rotor, characterised in that the at least one stator winding is provided with solid insulation and in that each winding is arranged to be directly connected via coupling elements (109) to a transmission or distribution network (110) having a voltage of between 2 and 50 kV, preferably higher than 10 kV.

26. A generator as claimed in claim 25, characterised in that it includes the features defined for the generator included in the plant as claimed in any one of claims 2 to 24.